Docket No.: 1568.1090

## **CLAIMS**

## What is claimed is:

- A cathode active material comprising: V
   a lithium transition metal composite oxide in which a carbon compound is adsorbed to obtain a carbon content of 10-1,000 ppm.
- 2. The cathode active material of claim 1, wherein the lithium transition metal composite oxide is at least one selected from the group consisting of LiNiO<sub>2</sub>, LiCoO<sub>2</sub>, LiMn<sub>2</sub>O<sub>4</sub>, LiFePO<sub>4</sub>, LiNi<sub>x</sub>Co<sub>1-x</sub>O<sub>2</sub> where 0 < x < 1, and LiNi<sub>1-x-y</sub>Co<sub>x</sub>Mn<sub>y</sub>O<sub>2</sub> where 0 < x < 1, and 0 < x+y < 1.
- 3. The cathode active material of claim 1, wherein the carbon compound has a specific surface area of 10-5,000 m<sup>2</sup>/g.
- 4. A method of preparing the cathode active material of claim 1, the method comprising:

mixing a transition metal compound and a lithium compound in a molar ratio of 1:1.0-1:1.2; and

thermally treating the mixture while supplying CO<sub>2</sub> and O<sub>2</sub> in a ratio of partial pressures ranging from 1:0.001-1:1000.

- 5. The method of claim 4, wherein the thermally treating of the mixture is performed at a temperature of 600-1,000 °C.
- 6. The method of claim 4, wherein the lithium compound is selected from the group consisting of lithium carbonate, lithium hydroxide, lithium nitrate, lithium sulfate, lithium acetate, and lithium oxide.
- 7. The method of claim 4, wherein the transition metal compound is selected from the group consisting of a transition metal carbonate, a transition metal hydroxide, a transition metal nitrate, a transition metal sulfate, a transition metal acetate, and a transition metal oxide.

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8. A lithium battery comprising:

a cathode comprising:

a cathode active material that comprises a lithium transition metal composite oxide in which a carbon compound is adsorbed to obtain a carbon content of 10-1,000 ppm;

an anode comprising a carbonaceous material to facilitate intercalating and deintercalating lithium ions;

a separator interposed between the cathode and the anode;

an electrolytic solution containing an electrolytic solute dissolved in a nonaqueous solvent; and

a current cut-off device that operates in response to a rise in an internal pressure of the lithium battery.

9. A lithium battery comprising: a cathode comprising:

a cathode active material that comprises a lithium transition metal composite oxide in which a carbon compound is adsorbed to obtain a carbon content of 10-1,000 ppm and wherein the lithium transition metal composite oxide is at least one selected from the group consisting of LiNiO<sub>2</sub>, LiCoO<sub>2</sub>, LiMn<sub>2</sub>O<sub>4</sub>, LiFePO<sub>4</sub>, LiNi<sub>x</sub>Co<sub>1-x</sub>O<sub>2</sub> where 0 < x < 1, and LiNi<sub>1-x-</sub>  $_{v}$ Co<sub>x</sub>Mn<sub>v</sub>O<sub>2</sub> where 0 < x < 1, 0 < y < 1, and 0 < x+y < 1;

an anode comprising a carbonaceous material to facilitate intercalating and deintercalating lithium ions;

a separator interposed between the cathode and the anode;

an electrolytic solution containing an electrolytic solute dissolved in a nonaqueous solvent; and

a current cut-off device that operates in response to a rise in an internal pressure of the lithium battery.

10. A lithium battery comprising: /a cathode comprising:

a cathode active material that comprises a lithium transition metal composite oxide in which a carbon compound is adsorbed to obtain a carbon content of 10-1,000 ppm and wherein the carbon compound has a specific surface area of 10-5,000 m<sup>2</sup>/g;

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an anode comprising a carbonaceous material to facilitate intercalating and deintercalating lithium ions;

a separator interposed between the cathode and the anode;

an electrolytic solution containing an electrolytic solute dissolved in a nonaqueous solvent; and

a current cut-off device that operates in response to a rise in an internal pressure of the lithium battery.

- 11. The method of claim 4, wherein the ratio of partial pressures ranges from 1:1 to 1:100.
- 12. The method of claim 4, wherein the ratio of partial pressures ranges from 1:1 to 1:10.

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- 13. The lithium battery of claim 8, wherein the separator is selected from the group consisting of a glass fiber, polyester, TEFLON, polyethylene, polypropylene, polytetrafluoroethylene, and a combination of thereof.
- 14. The lithium battery of claim 9, wherein a polymer resin is utilized as a binding agent for the anode and the cathode, and wherein the polymer resin is a vinylidenefluoride-hexafluoropropylene copolymer having 8-25% by weight of hexafluoropropylene.